

CLAIMS

1. An elevator assembly comprising
an elevator door (34) mounted for movement relative to a car frame
5 (44); and
a sill (38) supported by said car frame (44) wherein said sill (38)
moves from a retracted position to an extended position when said elevator door (34)
is initially aligned with a landing door (36).
- 10 2. The assembly of claim 1, wherein said sill (38) extends outwardly
from underneath said elevator door (34) along a generally linear path to engage a
landing structure (40).
- 15 3. The assembly of claim 2 including a locking mechanism (52) for
selectively locking said sill (38) to said landing structure (40).
- 20 4. The assembly of claim 3, wherein said locking mechanism (52)
comprises an actuator (56), an arm (54) having a hook portion 58, and a pin (60)
mounted to said landing structure (40) wherein said actuator (56) actuates said hook
portion (58) to selectively engage said pin (60) to secure said sill (38) to said landing
structure (40).
- 25 5. The assembly of claim 4 including a door moving mechanism (50)
having a lock position where said elevator door (34) and landing door (36) are
prevented from opening and a release position where said elevator door (34) and
landing door (36) are allowed to move from a closed position to an open position
wherein said door moving mechanism (50) does not switch to said release position
until said hook portion (58) securely engages said pin (60).
- 30 6. The assembly of claim 4, wherein said actuator (56) comprises an
electric motor (68).

7. The assembly of claim 1, including an actuator and locking mechanism (63) having an electromagnet (64) mounted for movement with a shaft (66) driven by a solenoid (65) for selectively engaging a magnet target (71) mounted to a hoistway wall (32) to lock said car frame (44) in position relative to said landing structure (40) once said elevator door (34) is aligned with said landing door (36).

8. The assembly of claim 4 including a track (42) supporting said elevator door (34) for movement between open and closed positions, said track (42) including a first track portion (42a) and a second track portion (42b) that is non-parallel to said first track portion (42a); and a seal (46) positioned between said elevator door (34) and said car frame (44) wherein said door (34) applies a compressive sealing force against said seal (46) as said door (34) moves from said first track portion (42a) to said second track portion (42b).

9. The assembly of claim 8, wherein said sill (38) moves at a first extension speed and said elevator door extends (34) outwardly away from said car frame (44) at a second speed slower than said first speed to release compression on said seal (46).

10. The assembly of claim 1, wherein said sill (38) comprises a generally flat plate presenting a continuous unbroken surface that extends from the car frame (44) to a landing structure.

11. The assembly of claim 1, wherein said sill (38) extends outwardly from underneath a car floor (76) and is movable along a linear path toward a landing structure (40) and along a rotational path to automatically adjust for misalignment between said car floor (76) and said landing structure (40).

12. The assembly of claim 1, wherein said sill (38) is pivotally mounted to a car floor (76) and pivots away from said elevator door (34) to engage landing structure (40).

13. The assembly of claim 1, including an actuator and locking mechanism (110, 120) having at least one solenoid (112, 122) with an extendable shaft (114, 128) and a locking element (116, 130) mounted for movement with said shaft (114, 128) wherein said solenoid (112, 122) inserts said locking element (116, 130) through an opening (118, 134) in a hoistway wall (32) with said locking element (116, 130) subsequently moving from an unlocked position to a locked position to prevent relative movement between said car frame (44) and said hoistway wall (32).

10 14. A method for opening an elevator door assembly comprising the steps of:

aligning an elevator door (34) with a landing door (36);

extending a sill from underneath the elevator door (34) to engage a landing structure (40); and

15 opening the elevator (34) and landing (36) doors.

15. The method of claim 14 including the step of locking the sill (38) to the landing structure (40) prior to opening the elevator (34) and landing (36) doors.

20 16. The method of claim 15 including the step of releasing a door moving mechanism (50) only after the sill (38) is securely locked to the landing structure (40).

25 17. The method of claim 15 including the step of engaging a hook (58) supported for movement with the sill (38) to a pin (60) mounted to the landing structure (40) to lock the sill (38) to the landing structure (40)

18. The method of claim 15 including the steps of positioning a seal (46) between the elevator door (34) and a car frame (44); supporting the elevator door (34) on a track (42) for movement relative to the car frame (44) between open and closed positions; and compressing the seal (46) between the elevator door (34) and the car frame (44) as the door (34) moves from a first track portion (42a) to a second track portion (42b) that is non-parallel to the first track portion (42a).

19. The method of claim 18 including the steps of initially moving the elevator door (34) and the sill (38) in a first direction outwardly away from the car frame (44) once the elevator (34) and landing (36) doors are aligned, continuing to move the sill (38) in the first direction until the sill (38) engages the landing structure (40), and subsequently moving the elevator door (34) in a second direction parallel to the car frame (44) after the sill (38) is locked to the landing structure (40).

20. The method of claim 15 including the step of unlocking the sill (38) from the landing structure (40) in response to a request to move the elevator door (34) to a different landing door (36).

21. The method of claim 14 wherein the sill (38) comprises a plate presenting a continuous unbroken surface and including the steps of moving the sill (38) along a generally linear path extending from the elevator door (34) to the landing (36) door and completely bridging an operating gap formed between the elevator (34) and landing (36) doors with the plate.

22. The method of claim 14, wherein the sill (38) comprises a plate mounted to a car floor (76) and including the steps of pivoting the plate away from the elevator door (34) to engage the landing structure (40).

23. The method of claim 14 including the step of vertically adjusting the position of the sill (38) relative to the landing structure (40) to accommodate misalignment between a car floor (76) and the landing structure (40).

24. The method of claim 23, including the step of simultaneously rotating the sill (38) and moving the sill (38) in a linear direction toward the landing structure (40).